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(12) **United States Patent**  
**Joke et al.**(10) **Patent No.:** **US 9,636,742 B2**(45) **Date of Patent:** **May 2, 2017**(54) **BINDER COMPOSITION FOR MAKING  
FOUNDRY MOLDS**(71) Applicant: **KAO CORPORATION**, Tokyo (JP)(72) Inventors: **Takashi Joke**, Toyohashi (JP); **Toshiki Matsuo**, Toyohashi (JP)(73) Assignee: **KAO CORPORATION**, Tokyo (JP)

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See application file for complete search history.(56) **References Cited**

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*Primary Examiner* — Vickey Nerangis(74) *Attorney, Agent, or Firm* — Birch, Stewart, Kolasch & Birch, LLP(57) **ABSTRACT**

A binder composition for making foundry molds, comprising an acid-hardening resin, one or more 5-position-substituted-furfural compounds selected from the group consisting of 5-hydroxymethylfurfural and 5-acetoxymethylfurfural, and one or more compounds selected from the group consisting of urea and derivatives of urea, wherein the content of the 5-position-substituted-furfural compound(s) by percentage is from 1 to 60% by weight of the binder composition. The content of the compound(s) by percentage selected from the group consisting of urea and derivatives of urea is preferably from 0.3 to 10% by weight of the binder composition.

**14 Claims, No Drawings**